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MONTANA FISH & GAME DEPARTMENT

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Frank Dunkle

Director's Column

On Environment

Our nation now has in excess of 200,000,000 citizens and demographers are predicting this population to increase beyond 300,000,000 within most of our lifetimes. The most frightening aspect of these almost astronomical numbers of humans will be the demands they will make on this nation's natural resources. While our ability to produce human bodies seems unlimited, our natural resources, of course, are limited.

Montana is considered by many to be an "undeveloped" state, with vast quantities of natural resources. It also has the unique opportunity to develop these resources with the full technology of the 20th century and to profit from resource development mistakes made elsewhere and at other times. For example, it is technologically possible in this day and age to mine copper without polluting, to strip coal without leaving

devastated land, to irrigate without silting, to log without bulldozing, to fire steam generators without heating rivers, and to accomplish a variety of other things not possible during other generations or in other places. **We can** do all these things and I believe that now we **must**.

The experts and professionals for years have been warning and advising us against the abuses we are suffering upon our environment—advice and warnings that have been only partially heeded. Today, this attitude is rapidly changing and it is now the **public** that is demanding that this advice be heeded. This time the democratic government that is ours will most assuredly respond, for it is response to public demand that makes our system of government work better than any other form.

The Montana Fish and Game Department is receiving an ever increasing number of inquiries from the public about the environment. People want to know what is happening to it, and how they can involve themselves in the effort to obtain the best possible environment for Montana. While the purpose of this department always has been and will continue to be management of the state's fish and wildlife resource, we are extremely proud to have so many people turn to our department for information and leadership in the area of environmental quality.

The Fish and Game Department has long been concerned with the habitat, or environment, that produces fish and wildlife that so many Montanans have enjoyed in the past, that they enjoy today, and hopefully will enjoy for generations to come. It is becoming apparent that the environment which produces this wildlife is the same environment, in many respects, where man himself must live. In Montana at least the slogan "a liveable environment for wildlife is a quality environment for man", is more than just a cliché.

Development is coming to Montana, there is no doubt about that. Our burgeoning nation and its hundreds of millions of people will demand and get more coal, more power, more lumber, more copper, more and more of everything. Many of these natural resources will have to come from Montana. The harvesting of these natural resources will most assuredly affect the environment that produces fish and wildlife and that we all, in one way or another, live in. In order to meet the challenges of the increasing pace of these developments, the Montana Fish and Game Commission has authorized the creation of the Environmental Resources Division. The purpose of this division will be to make resource development as compatible as possible with the environmental needs of Montana's fish and wildlife, and thus preserve a quality environment for man.

This new division will concern itself with: water resource development, strip mine reclamation, water pollution abatement, administration of the Stream Preservation Act, pesticide contamination, and Fish and Game planning. The primary objective of this division will **not** be to deter or delay development, but to assist development and make it as compatible

as possible with the ecology of fish and wildlife. The challenge is not only to solve environmental problems, but to identify and capitalize on environmental improvement opportunities that present themselves.

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CAMPING CAN KILL YOU



Snug and warm in his camp unit, the modern camper has little to fear from the elements, but he does face new hazards.

Tenting on the old campground has become almost a lost art, even though millions of Americans have adopted camping as a favorite form of outdoor recreation. A relative handful of hardy outdoorsmen still have the stamina, or inclination, to rough it in a canvas tent and do their cooking in a cast iron skillet over an open fire. In their stead are the legions of shiny trailers and campers of all descriptions—trailers with pop-up tops, trailers with solid tops, and the ubiquitous pickup campers. No longer need the recreationist cope with the elements. He brings with him every comfort of home. With him also come some new hazards, many deadly.

One of the most common yet most ignored hazards that plagues modern campers is the danger of carbon monoxide poisoning from gas-fired appliances and heaters. The death of an entire family of four in Helena, Montana during the winter of 1968 focused attention on the danger here at home, but most persons still do not understand the problem. One writer who examined many camp units of various types stated that "Subacute carbon monoxide poisoning is believed to occur frequently among users of liquified petroleum gas appliances although it may be overlooked or confused with another disease and not properly identified. As greater use is made of

these units by an increasing number of inexperienced people, it can be expected that an 'out break' of CO poisoning will occur in the near future."

Carbon monoxide is a stealthy, silent killer that strikes without its victim even knowing that it's there. It is a colorless, tasteless gas slightly lighter than air. It does not have any odor and does not irritate the eyes or nose. Unfortunately, the body accepts it willingly. It is accepted by the oxygen-carrying part of blood (hemoglobin) 300 times more readily than life giving oxygen is accepted. As the blood becomes loaded with carbon monoxide, less and less oxygen is carried to the body tissues and

they begin to fail. The central nervous system is among the first to become impaired or to collapse.

The danger of carbon monoxide is present wherever any hydrocarbons such as common gas or liquified fuels are burned. This includes the gases commonly bottled for use in most trailer houses and camper units. The gases are called hydrocarbons because the materials from which they are made contain both carbon and hydrogen atoms. While the fuels burn, hydrogen atoms combine with oxygen of the air and produce vapor. If conditions are ideal for burning, the carbon atoms combine with oxygen and form carbon dioxide. However, conditions are hardly ever right for complete combustion. When combustion is not complete, much of the fuel carbon will combine with oxygen of the air to form carbon monoxide.

As outlined in the state of Washington's publication "Industrial Hygiene," the severity of the poisoning depends upon several factors, including the concentration in the air, the length of exposure, the degree of physical activity at the time of exposure and the individual's susceptibility. Persons with impairment of circulation, heart disease in any form, anemia, asthma, or other lung impairment, or any condition which speeds metabolism are more susceptible. Other environmental conditions which have an effect on the rate of poisoning are high temperatures, high humidity and low barometric pressures (high altitudes). Men are more susceptible than women because of their deeper breathing and children are more susceptible than adults because of their more rapid breathing."

Considering these factors, one would judge that the big game hunters are especially vulnerable to carbon monoxide poisoning. They are using camp units during late fall and early winter when weather is cold and there is greater need for heat. Because of the cold, windows are apt to be closed. In Montana, the camp sites are apt to be at comparatively high elevations.

What can be done then to prevent poisoning by carbon monoxide when using gas burning equipment in small places? Firstly, it is important

to realize that the senses cannot be depended upon to detect carbon monoxide. There are symptoms that develop from exposure, including a tight feeling across the forehead, headache, chest tightness, nausea, vertigo and general malaise. However, such symptoms are too often ignored or blamed on something like a "flu bug". Further, if the carbon monoxide intake is in an overwhelming quantity, the nervous system may be so suddenly and completely impaired that there is no chance of escape from a contaminated area. Prevention, then, is the best plan.

PREVENTATIVE MEASURES INCLUDE:

1. Provide good ventilation whenever gas lights or burners of any nature are being used. During the winter it is important to remember that snow accumulations on the roofs of camp or trailer units may hinder or prevent ventilation through ceiling ventilators. Check ventilators from the outside to make sure they are free of snow accumulations. Insure that they will remain clear of snow during the night.

2. Check all burners for proper maintenance and proper adjustment. A yellow flame indicates poor combustion. Excessive fuel in the fuel-air mixture tends to produce more carbon monoxide since there is insufficient oxygen for complete combustion.

3. Do not enter areas where car-

bon monoxide is suspected without first ventilating the areas well.

EMERGENCY LIFESAVING TREATMENT FOR CARBON MONOXIDE POISONING SHOULD INCLUDE:

1. Remove the victim to fresh, but not cold air.

2. Administer artificial respiration if breathing has stopped or is difficult.

3. Contact a physician as soon as possible.

4. Administer oxygen if available.

5. Assist the circulation by applying blankets to keep the victim warm and by rubbing the arms and legs.

Never let a CO victim get up and walk about until a doctor says he is recovered. Exercise speeds up the attack of CO on the heart.

Remember also that fire due to loose fittings in gas lines is a potential hazard. Gas couplings are often worked loose or damaged by vibration from traveling. Before starting a trip:

1. Check all equipment to see that it is in good working order.

2. Turn off the gas at its source.

After arrival at destination:

1. Check fittings for tightness and leaks. Leaks may be discovered by saturating joints, kinks, or other likely spots with a water and soap solution.

2. Air out unit before commencing operation of combustion equipment and provide proper ventilation.

BAG LIMITS BY THE NUMBERS

"Seems like computers are taking over everything," one long-time hunter said. "Now we'll have to pack calculators to figure a limit of ducks." His comments were aimed at a new system of figuring bag limits on an upcoming special waterfowl season in parts of several western states. At first glance, this so-called point system may appear a bit strange, but second glance shows it's actually quite simple and designed to give hunters an extra edge or two.

To lay some background for explanation of the point system, it would be appropriate to consider a

rather unique waterfowl situation that exists in Montana and some other western states. For years game workers in states along the Continental Divide have felt that mallards along the east slopes of the Rockies do not join the main streams of Central Flyway duck migrations. Consequently, the mallards do not come under heavy gun pressure and have been, in fact, grossly underharvested. Information gleaned from several years' of duck banding information convinced the U.S. Fish and Wildlife authorities that biologists had a good case, and in 1968 a

late experimental season on mallard drakes was authorized for parts of Montana, Wyoming and Colorado.

The drake only season in Montana was opened in the Central Flyway portion for 23 days, from December 14 of 1968 through January 5 of 1969. Results of the season were encouraging. Hunters were afforded additional recreation and there were no apparent ill effects on the wintering mallard populations in the experimental area. Hunters showed that they could successfully harvest mallard drakes while keeping illegal kills, both deliberate and accidental, at a minimum.

Game workers feel that there is a need for further departure from traditional waterfowl regulations in order to meet the changing times. In one report it is stated, "We believe the time is fast approaching when relationships between ducks and hunters will be so critical that management of every possible individual population must be precisely charted." Accordingly, there will be a special mallard drake season in parts of several states again this year. In Montana, it will be in the Central Flyway portion of the state from December 13 through January 4. As in 1969, special permits will be required during the season, and they will be issued free of charge from fish and game offices.

The new innovation will be a bag

limit based on a point system, so many points for each bird shot, depending upon the species and sex of the waterfowl. During the special season a mallard drake will count as 10 points and a mallard hen or any other species of duck (including coots and mergansers) will count as 40 points. When the hunter's last bird brings his total to 40 points or more, he's through hunting for the day. For example, he might have four mallard drakes for a total of 40 points; if his first bird is a mallard hen or any other species of ducks, then he's got his daily limit of 40 points; he may shoot three mallard drakes for a total of 30 points and then round out the limit with another species of duck or a 40 point mallard hen which would give him a maximum total of 70 points. The possession limit will be two legal daily limits.

The point system was tried for the first time last season in a small Colorado Valley and seemed to work well. It's designed to help the hunter by allowing him to stay within the law if he shoots some kind of duck that he didn't intend to, or if he has difficulty in identifying ducks on the wing. At the same time, it offers a bonus of more birds to the hunter who is able to identify his target correctly. Another advantage is that it can selectively and purposely put the bulk of hunting pressure

on a desired species and sex of waterfowl.

No matter what kind of seasons or bag limits are in effect, there will be a certain amount of deliberate illegal harvest. Analysis of hunter performance surveys conducted during the 1968-69 special mallard drake season, however, showed a low illegal kill of hens or other waterfowl. Most hunters accept the challenge of good sportsmanship and different approaches to game management. The point system allows the hunter to make an honest mistake without breaking the law. In making recommendations for the special season, waterfowl biologists from Montana, Wyoming, Colorado, Nebraska, and New Mexico stated "The drake-only experiment in 1968 indicated that illegal species and sexes made up as much as 10 percent of the total kill. Thus, even though performance checks revealed that hunters demonstrated restraint in selecting targets, a number of birds other than mallard drakes were taken. Have we, therefore, placed the hunter in a position of breaking the law when he had no intention of doing so? Can the point-system bag reduce the illegal kill without measurably increasing the harvest of birds other than target species—in this case mallard drakes?" Our special season this winter will help answer these questions.



Mule deer are creatures of orderly habit and return to the same winter foraging areas year after year. photo by O. Burton Westcoat

HUNTING SEASONS, WEATHER AND MULE DEER HARVEST IN THE STILLWATER AREA

by Arnold Foss

The Stillwater River and its tributaries are located in southcentral Montana. The upper drainage originates in massive cirques of the Bear-tooth Mountains where some of the higher peaks rise over 12,000 feet. The lower reaches are through rolling foothills and eventually the river empties into the Yellowstone River near Columbus. Between the high rocky basins and the mouth of the Yellowstone, a vast array of habitat (approximately 1,100 square miles) is available to mule deer.

Much of the terrain above 9,000 feet is too rough and broken for extensive use by mule deer. Some sites

are well vegetated and are frequented especially by large mature males. Below timber line (approximately 9,000 feet), a timbered belt extends to the foothill region near 6,000 feet. It is this large timber zone that makes up the major part of the mule deer summer range. During this season food is abundant and the living is easy.

As fall rolls around with chilling winds and snow storms, things start to change in the mountains. Much of the lush vegetation available during the summer has dried with the killing frost, and its value as food has diminished substantially. As the season progresses and snow accumulates, deer are forced to move to lower elevations to find food. The expansive area that was suitable summer range has been reduced many times. The winter feeding areas in many instances constitute less than 5 percent of the area available to deer during the summer season. During the winter major foraging areas are southerly exposed foothill slopes that receive most direct sunlight, consequently, they are the first sites where snow melts and forage is exposed. It is necessary that the south slopes contain browse (brushy plants) that the animals can and will eat. The browse must also be situated near suitable protective cover. Mule deer are creatures of orderly habit and return to the same winter foraging areas year after year. This behavior of the animals coupled with the restricted nature of the winter ranges makes the wintering areas the key to mule deer survival.

The importance of winter range to big game animals in large measure dictates guide lines on which game management programs must be based. Game management objectives aim to provide as many animals as possible for sport hunting and other recreational pursuits compatible with other land uses and maintenance of breeding populations. This objective can be accomplished only if animal habitat requirements and the maintenance of the habitat are considered. In the case of big game, maintenance of habitat necessitates manipulation of animal numbers to obtain a reasonable ratio of animals to available winter forage. Hunting seasons then

are multipurpose—in addition to providing sport hunting for people, they are the primary method for control of game animal populations. Too many animals wintering on an area for years in succession will result in plant damage and deterioration that may take several decades to remedy. Maintaining proper numbers will allow healthy plant growth and ultimately provide forage renewal year after year. The quantity and quality of winter forage on these sites will determine the welfare of mule deer populations for the future hunting and recreation of Montanans.

The rough terrain associated with much of the Stillwater has been a

deterrent to many a hunters' success. Season dates are set so hunters have a reasonable opportunity for success and palatable game. Seasons also are scheduled to allow the animals ample opportunity to have produced the annual crop of young.

The Stillwater area is similar to many mountain deer ranges in Montana. The problem of managing deer in mountain areas varies little from one region to another. The major problem associated with deer management is one of keeping deer populations balanced with winter forage. This is more pronounced in the mountain areas where animals can

(Continued on Next Page)



Fish and Game sharpshooters, H. Max Stone (L) and Doug Getz.

FISH & GAME MEN TAKE HONORS IN PISTOL SHOOT

Top honors for team events in the annual Montana State Peace Officers Combat Pistol Championships have been captured by two Fish and Game men, Warden Doug Getz of Helena and District 7 Supervisor Max Stone of Miles City. Getz and Stone shot their way to a combined score of 1138. Highest possible score was 1200 points.

Second place was taken by a team from the Seattle Police Department with a total score of 1110, followed by another Fish and Game team for third spot. The third place was cap-

tured by wardens Bud Hubbard of Stanford and Dave Cooper of Plentywood. Their combined score was 1084.

Getz also topped the grand aggregate score with 1452 points out of a possible 1500. The federal first place went to Marvin Irvine, U. S. Border Patrol, Havre, while the state first place award went to warden Jim Logan of Miles City.

Fifteen teams and 33 individuals throughout the northwest participated in the shoot which was held in Great Falls.

readily elude hunters and because of the limited winter range. Let's take a close look at some of the management information from the Stillwater and see how we have been progressing with our objectives the past ten years.

Figures 1 through 4 graphically portray trends in condition of winter range, in numbers of hunters, deer harvest, hunter success and in seasonal precipitation.

A variety of hunting seasons have been tried during the past ten years. The basic deer season has opened near mid-October and run through the major part of November, consisting of 36 days. During the past five years the season has been somewhat later—with the opening date near October 25. There have been additional special seasons, the most common a reopening during December. This late three-week season has opened the first week in December. The general bag limit has remained at two deer during all of the open seasons. Special nonresident permits for one deer have been available for eight of the ten years.

The graph in Figure 1 gives an indication of the trend in condition of plants on the major winter ranges in the area. It has been determined through detailed plant studies that if more than 20% of the plants on an area are in poor health, due primarily to excessive animal browsing or grazing, the trend in plant condition will be down. In other words there will be a reduction in the numbers of plants due to increased mortality; the plants that do survive will be less thrifty and produce little surplus forage for animals to eat. The overall trend in plant condition during the ten years is one of a reasonably good condition on winter ranges in 1959, deteriorating rapidly through 1963. In 1964 the trend was headed off and the curve started a gradual slope toward range improvement which continued through 1968.

The relative numbers of deer harvested by seasons and the hunters participating are shown in Figure 2. This graph indicates some substantial fluctuation in yearly hunter numbers and deer harvest for the ten-year period. The trend in hunter success (Figure 3) is a function of deer harvested in relation to the number of

Figure 1. Trends in condition of forage plants on mule deer winter range in the Stillwater area, 1959-1968



Figure 2. Trends in deer harvest in the Stillwater area from 1959 through 1968



hunters participating and the relative availability of deer. Consequently, it follows the general shape of the curve observed in Figure 2. Fall precipitation is graphed in Figure 4. The time sequence relates to the three months when hunting seasons are in progress.

If the graph depicting fall precipitation is superimposed on Figure 2, it is apparent that there is a correlation. For example, the lowest precipitation levels occurred during 1963 and 1965; trends in deer harvest also were low during these years. Peaks in precipitation generally correspond to peaks in deer harvest, hunter participation and hunter success. There are exceptions

to this trend as can be observed for 1959 and 1960 when harvest trends appear to exhibit an indirect relationship to fall precipitation. The graphs show only very general relationships.

The time during the three-month period that the precipitation occurred is quite significant. In 1964, over three inches of precipitation fell during December which accumulated in the form of snow and was very effective in moving deer to lower elevations and making them much more vulnerable to the hunter. Highs that occurred in 1967 were most pronounced early in October and did not have as much effect on deer movement and consequently hunter

Figure 3. Trends in deer hunter success in the Stillwater area from 1959 through 1968

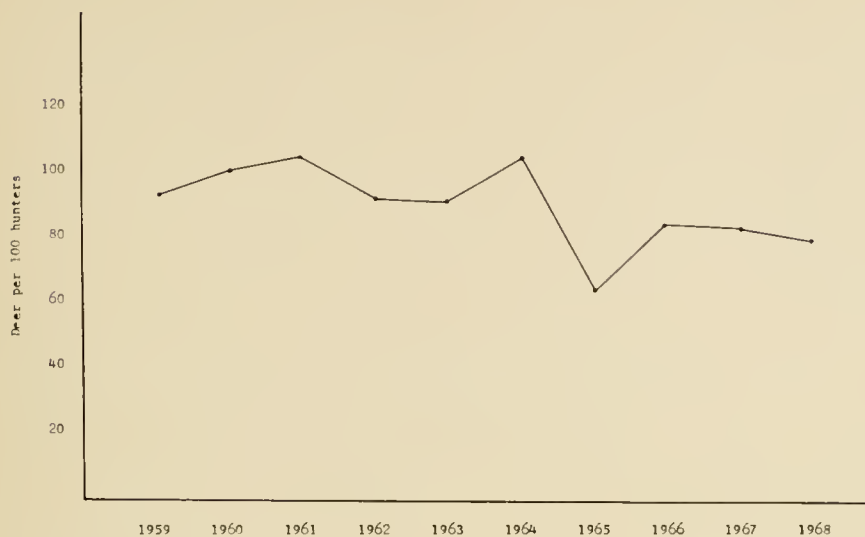


Figure 4. Trends in precipitation in the Stillwater area (October, November, December) from 1959 through 1968



harvest. The general point that is worthy of consideration at this time is that deer harvest in mountain terrain is directly related to fall precipitation provided the precipitation in snow form comes in substantial quantity to stimulate deer movement to lower elevations where they are more readily available to the hunter.

What about the length of hunting seasons and the bag limit during the period? How did they influence deer harvest and hunter success? The general structure and bag limit was discussed earlier, but without specific reference to years. The lengths of the seasons and the bag limits can have a significant influence on deer harvest under certain conditions. In the Stillwater area the general deer

season coupled with a late December season was in effect seven of ten years; in 1959, 1963 and 1965 only the general season was opened. Considering this in light of deer harvest trends in Figure 2, we note that the low points in hunter numbers and deer harvest also occurred during 1959, 1963 and 1965. Data from hunter harvest surveys show that 15 to 20 percent of the mule deer harvest for the Stillwater area is obtained during the December season.

The late season does not entirely account for the difference in annual harvest figures; however, it provides better odds for taking advantage of potential fall storms that are likely to occur during the December season.

We can see at this point that annual harvest is influenced measurably by weather conditions in connection with the season length. It is also apparent that hunters are aware that their chances are better during more severe weather since their numbers are highest during these years. The bag limit has been the same in the Stillwater area during the past ten years (two deer per hunter). Allowing the second deer in the seasonal bag is simply a means of increasing deer harvest. The effectiveness of the bag limit is also closely related to hunting conditions. If the proper weather and field conditions prevail, a two-deer bag limit can appreciably add to the overall deer harvest. If hunting conditions are poor, the second deer bag is less meaningful.

Since a major objective of management was to reduce deer numbers to allow improvement in range condition, it might be easy to conclude at this point that we are out of the woods as the trend in range condition is improving (Figure 1). Before making this conclusion, we might take note that the trends in deer harvest, hunter numbers and success have been showing some gradual decline from 1966 through 1968. This is a common occurrence in areas where deer populations have declined or have been reduced—the hunter finds the going a little tougher and seeks another place to hunt. If this trend is marked it can result in such a reduced deer harvest that any accomplishments made in range condition can rapidly be lost due to lack of hunting pressure.

Declines in the number of resident hunters were noted in the Stillwater area from 1964 through 1968. The trend was most pronounced in 1967 at which time substantial changes in hunting license structure and cost of the second deer tag apparently influenced the trend appreciably. In an attempt to maintain the needed hunter harvest, the non-resident deer permits were increased. The special nonresident deer license is again a management tool that can be used when resident hunters don't accomplish management needs. There are problems associated with increasing the number of nonresidents; it takes time to con-

vince interested persons that additional deer harvest is needed and that there aren't enough resident hunters to do the job. There is also reluctance on the part of Montanans to want many nonresidents hunting in their favorite grounds. The basic resource needs are not always considered in the detail they should be when problems of this nature arise.

Summarizing conditions in the Stillwater area, we find a winter range rapidly deteriorating from 1959 through 1964, then gradually leveling off and showing some improvement. During this interval, over 21,000 hunters bagged 19,000 mule deer for an overall success rate of approximately 90%. Seasonal precipitation, particularly during the hunting season, had pronounced effects on deer harvest and hunter success. A variety of hunting seasons have been tried; the most suc-

cessful one in terms of game management objectives has been the general big game season (mid-October through November) coupled with a late December reopening. As the result of some reduction in mule deer population, hunter participation, success and deer harvest has declined somewhat during the past three years. The reduction in resident hunter numbers was aggravated in 1967 due to the increase in deer license costs. Overall reduction in resident hunter numbers has been partially countered by increasing special nonresident deer permits.

Improvements in deer winter range condition and ultimately deer population condition can be accomplished only through conscientious game management programs. Such programs involve reducing deer populations to levels compatible with habitat. This is done by increasing

and maintaining hunting pressure in an area until the job is accomplished. Harvest trends in the Stillwater presently indicate that this will necessitate utilizing substantial numbers of nonresident hunters. Hunting seasons will have to be open at the time that major deer populations have moved to the winter ranges, late in the season. This type of program ordinarily is not very popular; many people are inclined to react to it in an adverse manner, finding it hard to accept that the lot of mule deer can be improved by shooting them. On the other hand, a number of people have accepted nature for what it is and have endeavored to back sound resource programs. Successful resource programs must have the support of many dedicated people. We believe that our game management program is sound and worthy of the support of all Montanans.

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